**NBKR INSTITUTE OF SCIENCE & TECHNOLOGY :: VIDYANAGAR**

*(AUTONOMOUS)*

**CIVIL ENGINEERING**

SCHEME OF INSTRUCTION AND EVALUATION

(With effect from the batch admitted in the academic year 2013-2014)

**III YEAR OF FOUR YEAR B.TECH. DEGREE COURSE – II SEMESTER**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S.No. | Course  Code | Course Title | Contact  Hours/  Week | | | Credits | Evaluation | | | | | | | | | |
| Sessional  Test-I | | Sessional  Test-II | | | Total Sessional Marks (Max. 40) | Semester  End Examination | | Max.  Total Marks | |
| **THEORY** | L | P | T |  | Duration  in Hours | Max.  Marks | Duration  in Hours | | Max.  Marks | 0.8(Better of two sessional tests)  +  0.2(Other) | Duration  in Hours | Max.  Marks |  | |
| 1 | 13CE3201 | R.C.C. Structural Design - II | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 2 | 13CE3202 | Hydrology | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 3 | 13CE3203 | Structural Analysis -II | 3 | - | 1 | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 4 | 13CE3204 | Concrete Technology | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 5 | 13CE3205 | Environmental Engineering - I | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
| 6 | 13CE32EX | Elective –I | 4 | - | - | 4 | 2 | 40 | 2 | | 40 | 3 | 60 | 100 | |
|  | | **PRACTICALS** |  |  | | | | | | | |  |  | | | |
| 1 | 13SH32P1 | Advanced Communication Skills Laboratory | - | 3 | - | 2 | - | - | | - | - | Day-to-day Evaluation and a test | 3 | 60 | | 100 |
| 2 | 13CE32P1 | Highway Materials Laboratory | - | 3 | - | 2 | - | - | | - | - | 3 | 60 | | 100 |
|  |  | **TOTAL** | **22** | **06** | **02** | **28** |  |  | |  |  |  |  | | **800** |

**Elective I:**

13CE32E1 Industrial Steel Structural Design

13CE32E2 Advanced Foundation Engineering

13CE32E3 Transportation Planning

13CE32E4 Industrial Waste and Waste Water Management

13CE32E5 Ground Water Hydrology

**13CE3203 - STRUCTURAL ANALYSIS –II**

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| --- | --- | --- | --- |
| **Course category:** | Program core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3 - 1 - 0 |
| **Prerequisite:** | Structural Analysis –I (III –I) | **Sessional Evaluation :**  **Univ.Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| **Course Outcomes** | CO1 | Be able to draw influence line diagram for determinate structures under various loadings. |
| CO2 | Be able to understand the static and kinematic indeterminacies of structures and apply Castigliano’s theorem-II |
| CO3 | Be able to draw SFD and BMD of indeterminate structures using slope deflection and moment distribution methods. |
| CO4 | Be able to draw SFD and BMD using Kani’s method.. |
| CO5 | Understand the concept of plastic analysis and be analyse indeterminate structures |
| **Course Content** | **UNIT – I**  **INFLUENCE LINES :** Influence lines for reactions SF and BM for determinate structures – Maximum BM and SF for single, two and multipoint loads – UDL longer and shorter than span and EUDL.  **UNIT – II**  **INDETERMINATE STRUCTURES:** Determination of static and kinematic indeterminacies – Solution of trusses having up to two degree of internal and external indeterminacies – Castigliano’s theorem – II.  **UNIT – III**  **STATICALLY INDETERMINATE BEAMS AND FRAMES:**   1. **Slope – Deflection method** with degree of indeterminacy not exceeding three – Effect of sinking 2. **Moment Distribution method** including frames with sway limited to single bay single storey – effect of sinking of supports.   **UNIT – IV**  **KANI’S METHOD:** Continuous beams – settlement of supports – single bay portal frames with side sway.  **MULTISTOREYED FRAMES:** Analysis of multi-storeyed frames using, portal and cantilever methods.  **UNIT – V**  **PLASTIC ANALYSIS:** Idealized stress – strain diagram – Shape factors – Moment-Curvature relationships – Plastic hinges – Collapse Mechanism – Analysis of fixed and continuous beams and portal frames. | |
| **Text Books and reference Books:** | **TEXT BOOKS:**   1. Structural Analysis Vol. I & II by S. S. Bhavikatti. 2. Comprehensive structural Analysis Vol. I & II by R. Vaidanathan & P. Perumal. 3. Analysis of Structures Vol. I & II by V.N. Vazirani & M.N. Ratwani.   **REFERENCE BOOKS:**   1. Theory of Structures Vol.I by S. P.Gupta, G.S. Pandit & R. Gupta. 2. Mechanics of Structures Vol.II by S.B. Junnarkar. 3. Structural Analysis by L.S. Negi & R.S.Jangid. 4. Steel Structures Vol. II by Ramchandra. | |